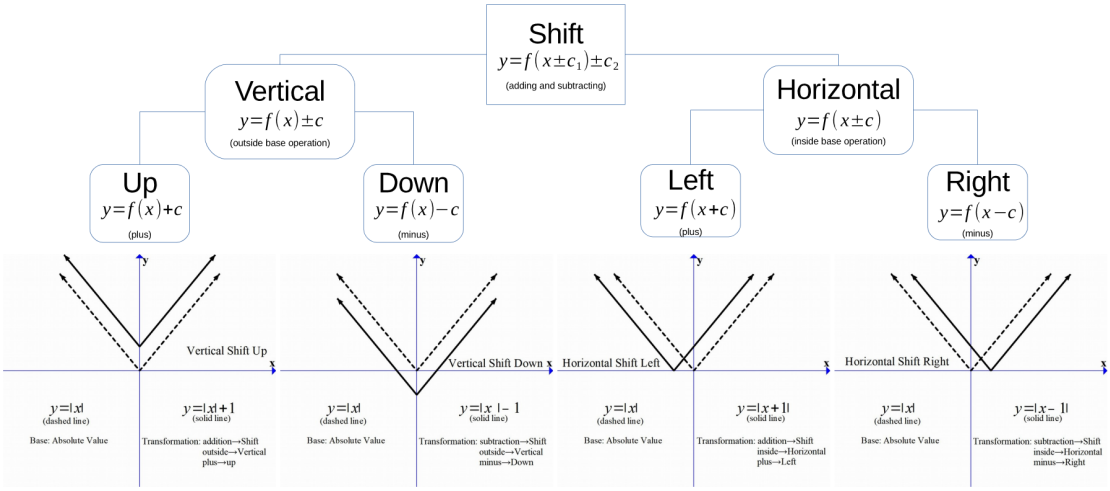
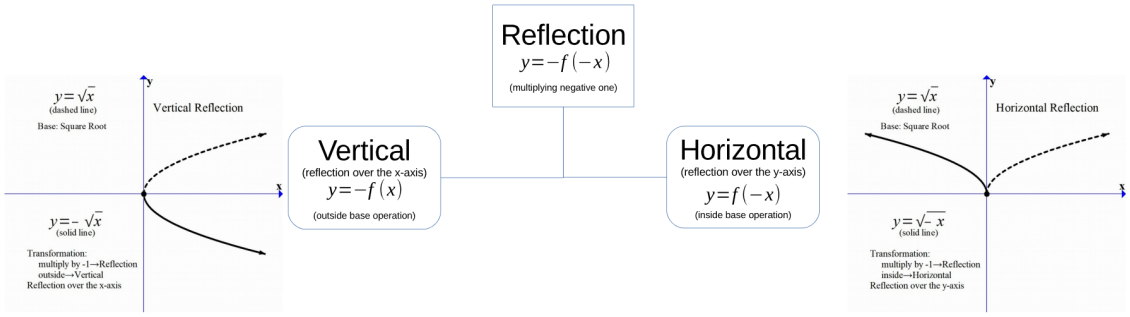
3.5 Graphing Techniques: Transformations

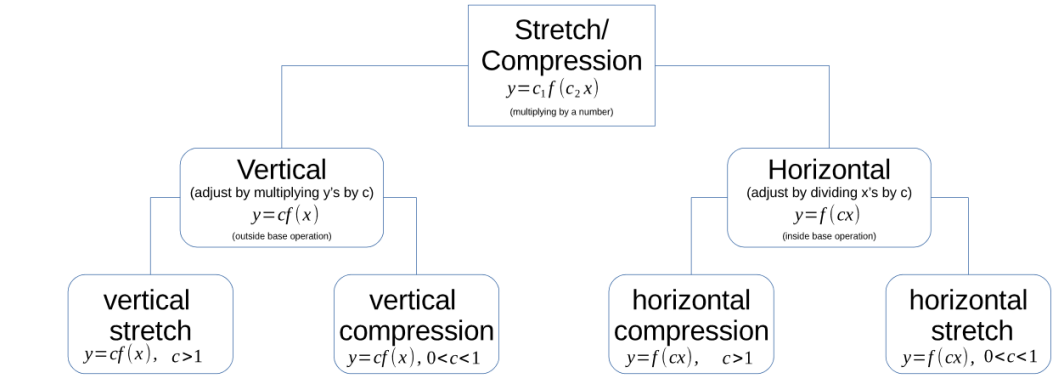
- Transformations
  - Shift (add or subtract a number)

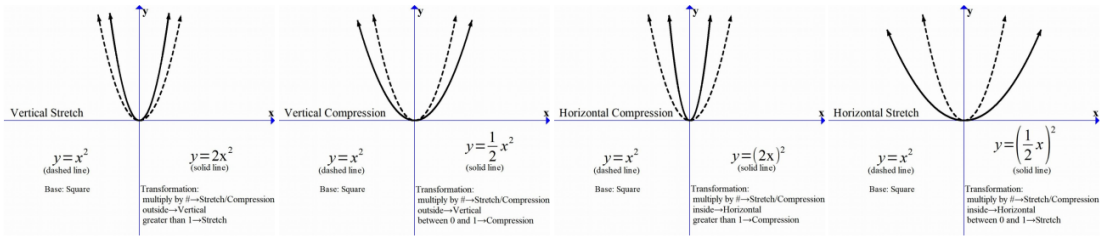


  - Reflection (multiply by a negative)



▼ Stretch\Compression (multiply by a number not equal to 1)





▼ Examples: Graphing with Transformations

▼ Example 1

$$f(x) = -(x-2)^2 + 3$$

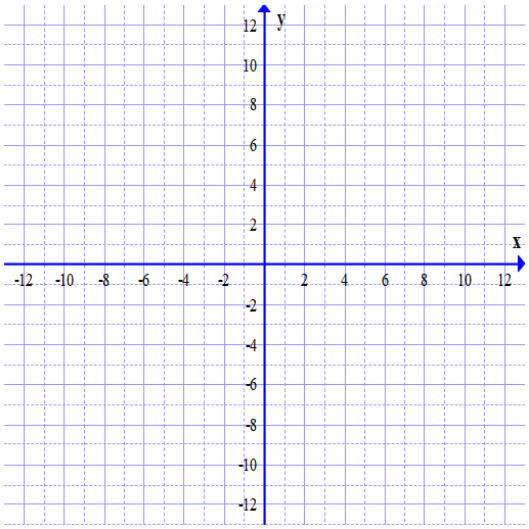
Base Function: _____

List Transformations:

_____

_____

_____



▼ Example 2

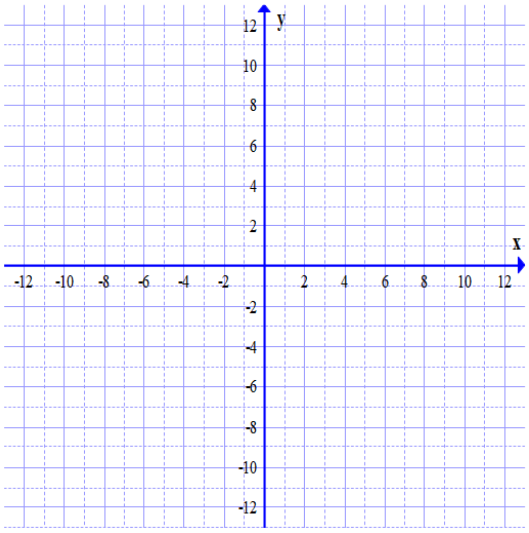
$f(x) = -|x+1| - 4$

Base Function: _____
List Transformations:

_____

_____

_____



▼ Example 3

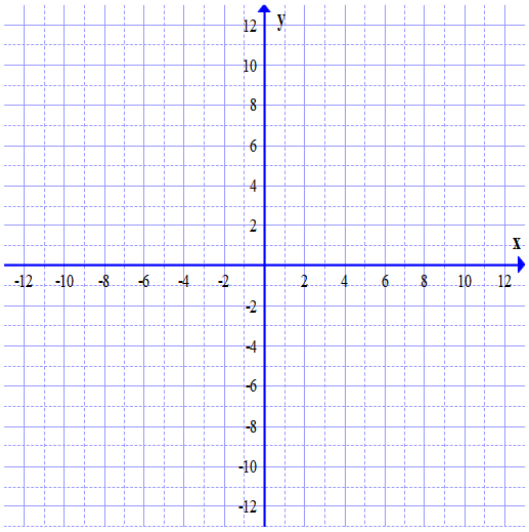
$f(x) = -\sqrt{-x} + 2$

Base Function: _____
List Transformations:

_____

_____

_____



▼ Example 4

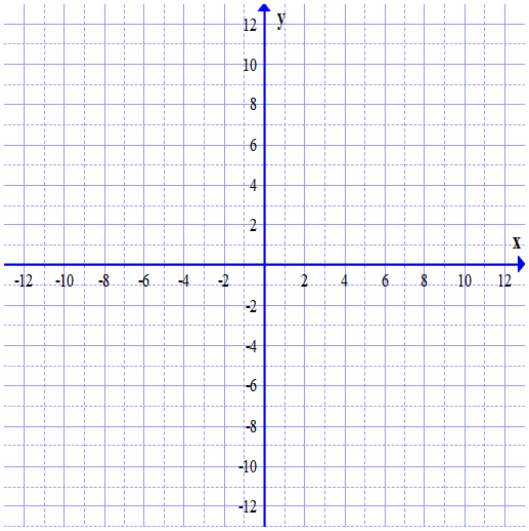
$f(x) = (x+1)^3 - 4$

Base Function: _____
List Transformations:

_____

_____

_____



▼ Examples: Write the Equation

▼ Example 1: Write the function whose graph is the graph of $y = \sqrt{x}$, but is shifted up 2 units.

▼ Example 2: Write the functions that is finally graphed after the following transformations are applied to the graph of $y = \sqrt{x}$ in the order listed.

1) Shift down 2 units

2) Reflect about the x-axis

3) Reflect about the y-axis

▼ Examples: Transform the Point

▼ Example 1: If $(-9, 2)$ is a point on the graph of $y = f(x)$, which of the following must be on the graph of $y = -f(x)$

▼ Example 2: Suppose that the x-intercepts of the graph of $y = f(x)$ are -3 and 8.

a) What are the x-intercepts of the graph of $y = f(x + 9)$?

b) What are the x-intercepts of the graph of $y = f(x - 2)$?

c) What are the x-intercepts of the graph of $y = 7f(x)$?

d) What are the x-intercepts of the graph of $y = f(-x)$?

▼ Example: Use completing the square and then graph with transformations

$f(x) = -3x^2 - 42x - 144$